



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.                | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------------|-------------|----------------------|---------------------|------------------|
| 10/525,847                     | 02/25/2005  | Mitsuo Tsukamoto     | Q85912              | 2196             |
| 23373                          | 7590        | 08/18/2006           | EXAMINER            |                  |
| SUGHRUE MION, PLLC             |             |                      | WU, IVES J          |                  |
| 2100 PENNSYLVANIA AVENUE, N.W. |             |                      | ART UNIT            |                  |
| SUITE 800                      |             |                      | PAPER NUMBER        |                  |
| WASHINGTON, DC 20037           |             |                      | 1724                |                  |

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



### **DETAILED ACTION**

(1). Applicants' Request-for-Continued Examination (RCE) filed on June 30, 2006, Amendments dated on June 6, 2006 have been received.

Claims 1 and 2 are amended.

An Office Action responded to this RCE, Amendments dated June 6, 2006 is introduced herein.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claims 1 and 2, it cites: *substantially without using an aqueous medium*. However, it is not literally supported in the applicants' specification. Therefore, it would be unclear whether it is new matter or not because there is no explicit statement excluding the use of aqueous medium in the applicants' specification.

Rest claims are rejected because they depend on claim 1 or 2.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

(2). **Claims 1, 5-12 and 18** are rejected under 35 U.S.C. 102(e) as being anticipated by DeSimone et al (US006716945B2).

(3). DeSimone et al (US006716945B2) disclose a multimodal fluoropolymer and methods of making the same (Title). A method for forming a fluoropolymer comprises providing a reaction mixture comprising carbon dioxide, at least one fluoromonomer, and an initiator; and reacting at least one fluoromonomer in the reaction mixture to form a fluoropolymer (Abstract, line 1-5). In another aspect, the fluoropolymer preferably has **a weight average molecular weight to number average molecular weight ratio of from about 2 to about 6** (Col. 7, line 31-34). The preferred fluoromonomers include **vinylidene fluoride** (Col. 3, line 33-38). The fluoromonomers may be in gaseous state or **liquid state** (Col. 3, line 5-6). The reaction mixture typically employs carbon dioxide as a continuous phase. In one preferred embodiment, the **CO<sub>2</sub> is utilized in a “supercritical” phase** (Col. 2, line 53-54). The fluoromonomers are polymerized in the presence of a polymerization initiator. A number of initiators can be employed. In preferred embodiments, the initiator is a **peroxydicarbonate**. A preferred peroxydicarbonate is ethyl peroxydicarbonate (Col. 4, line 27-34). The initiator may be added in neat form, as a solution in carbon dioxide, or it may conveniently be added as a solution in a cosolvent (Col. 4, line 41-44). The polymerization reaction mixture may also include one or more cosolvents. Illustrative cosolvents include but are not limited to, **perfluorocarbons, hydrofluorocarbons** and the like (Col. 4, line 45-48). The polymerization reaction mixture includes a **chain transfer agent** for regulating the molecular weight of the resulting polymer (Col. 4, line 56-59). The method can be carried out **continuously** with thorough mixing of the reactants in any appropriately designed reaction vessel (Col. 5, line 11-14). Preferably, the polymerization temperature ranges from about **0°C to about 100°C**. Precipitation polymerization is preferred (Col. 5, line 32-37). In general, as an example, the

Art Unit: 1724

pressure employed preferably range from about **200 psia to about 50,000 psia** (Col. 2, line 64-66). In Table 1,2 and 4, the **M<sub>w</sub> can be more than 150,000** (Col. 9-12).

As to the fluoropolymer producing method to be substantially without using an aqueous medium in **independent claim 1**, DeSimone et al do not disclose the use of aqueous medium in the patentee's method.

As to limitation of **claim 6**, DeSimone et al disclose in Table 2, in the steady state, the difference of VF<sub>2</sub> in and VF<sub>2</sub> out would indicate the amount of fluoropolymer produced in the reaction vessel such as Run F, the difference of 0.26 mol/L is equivalent to 11.44 g per liter for the capacity of reaction vessel.

### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

Art Unit: 1724

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(4). **Claim 4** is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over DeSimone et al (US006716945B2).

As to the monomer density/monomer critical density not lower than 1.1 in the defined reaction field in fluoropolymer producing method in **claim 4**, it is well known in the art that the critical temperature of VF<sub>2</sub> is 643 psig, critical temperature is 30.1 °C and its critical density is 0.417 g/cc (data provided by Stallings - US003780007). DeSimone et al disclose that the monomer can be in liquid state in the reaction (Col. 3, line 5-7). Therefore, the monomer density of DeSimone et al would inherently be greater than the critical density in order to become a liquid. Illustrated in Table 2 as well as the broad disclosure for reaction temperature (Col. 61-64). The ratio of monomer density/monomer critical density in the method of DeSimone et al also would inherently reach not lower than 1.1. Since USPTO does not have proper means to conduct the experiments and measurement, the burden now is shifted to applicants to prove otherwise. *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

Art Unit: 1724

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(5). **Claims 2,3,13-17 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over DeSimone et al (US006716945B2).

As to the limitation of **independent claim 2**, the disclosure of DeSimone et al is incorporated herein by reference, the most subject matters of continuous polymerization in a defined reaction-field in the presence of carbon dioxide, defined reaction-field being in supercriticality-expression state, fluorine-containing ethylene monomer,  $M_w$  not lower than 150,000 and  $M_w/M_n$  higher than 1 but not higher than 3, polymerization to be substantially without using an aqueous medium as currently claimed, have been recited in paragraph (3).

As to the carbon dioxide amounts to at most equimolar to radical polymerizable monomer in **independent claim 2**, in absence of showing criticality of records, the optimized amount of carbon dioxide to be at most equimolar to radical polymerizable monomer in known process renders prima facie obviousness within one of ordinary skill in the art. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

As to the limitations of **claim 3**, DeSimone et al disclose the Table 1 in which the pressure being 4000 psig which is equivalent to 27.7 Mpa. The polymerization temperature ranges from about 0°C to about 100°C (Col. 2, line 61-64).

As to limitation of **claim 13**, DeSimone et al disclose the polymerization reaction mixture including a chain transfer agent for regulating the molecular weight of the resulting polymer (Col. 4, line 56-59).

As to limitation of **claim 14**, DeSimone et al disclose in Table 2, in the steady state, the difference of  $VF_2$  in and  $VF_2$  out would indicate the amount of fluoropolymer produced in the reaction vessel such as Run F, the difference of 0.26 mol/L is equivalent to 11.44 g per liter for the capacity of reaction vessel.

As to limitation of **claims 15 - 17**, DeSimone et al disclose a number of initiators to be employed. In preferred embodiments, the initiator is a **peroxydicarbonate**. A preferred peroxycarbonate is ethyl peroxydicarbonate (Col. 4, line 27-34).

Art Unit: 1724

As to limitation of **claim 19**, DeSimone et al disclose the method being carried out continuously with thorough mixing of the reactants in any appropriately designed reaction vessel (Col. 5, line 11-14).

***Response to Arguments***

Applicant's arguments with respect to claims 1 and 2 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

Art Unit: 1724

Date: August 15, 2006

DUANE SMITH  
PRIMARY EXAMINER

*D - [Signature]*  
*8-16-06*